ABSTRACT OF THE DISCLOSURE

A method is disclosed for operating a synchronous space division multiple access, code division multiple access communications system, as is a system that operates in accordance with the method. The method operates, within a coverage area of a base station (BS), to assign the same spreading code to a plurality of subscriber stations (SSs; to despread a plurality of received signals with a plurality of despreaders and to spatial filtering the plurality of despread received signals. The step of spatial filtering uses complex multiply operations performed at the symbol rate of the received signal. An antenna array has M-elements (M>1), wherein individual ones of P orthogonal spreading codes are reused αM times within the coverage area, where $1/M < \alpha \leq 1$. The step of spatial filtering includes steps of operating the subscriber stations to obtain channel estimates containing a path amplitude and phase from each of m BS antenna elements and to send the m channel estimates back to the BS as a spatial signature vector. The BS, from the spatial signature vectors received from a plurality of same-code subscriber stations, computes antenna element weight vectors. In the forward link there is disclosed a method for operating a synchronous space division multiple access, code division multiple access communications system. The method operates, within the coverage area of the BS, to assign the same spreading code to a plurality of SSs, and for individual ones of a plurality of same-code subscriber stations, to spatially filter a signal to be transmitted, to combine the outputs of a plurality of spatial filters to provide a combined signal to be transmitted and to spread the combined signal prior to transmitting the combined signal.